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National Association of Regulatory Utility Commissioners

February 22, 2000

Ms. Wendy R. Dixon, EIS Project Manager M/S 010
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P. O. Box 30307
North Las Vegas, NV 89036-0307

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FEB 2 3 2000

Re: Draft Environmental Impact Statement (EIS) for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (DOE/EIS-0250-D)

Dear Ms. Dixon:

The National Association of Regulatory Utility Commissioners (NARUC) submits the attached comments on the Yucca Mountain Draft EIS.

These detailed written comments supplement the oral comments made by State public utility commissioners (and NARUC members) at public hearings held in Atlanta on October 21, 1999 and Washington, DC on October 26, 1999.

The DEIS comprehensively analyzes the environmental impacts of this very complex and important federal project. DOE should be commended for the extensive public outreach efforts made since the initial scoping in 1995 through widespread distribution of the document, extensive open meetings in 11 States and a 180 day public comment period.

We appreciate the opportunity to comment on the DEIS and urge DOE to continue the site characterization and suitability decision process so that spent nuclear fuel can be moved from reactor storage sites to a fully licensed repository at Yucca Mountain at the earliest possible time.

Sincerely.

Charles D. Gray Executive Director

Cc: Dr. Ivan Itkin, OCRWM

Attachment



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## **National Association of Regulatory Utility Commissioners**

Review Comments On

U.S. Department of Energy
Draft Environmental Impact Statement (DEIS)

For a

Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste At Yucca Mountain, Nye County, Nevada

DOE/EIS-0250D

February, 2000

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Introduction

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The enclosed comments are provided by the National Association of Regulatory Utility Commissioners (NARUC) to the Yucca Mountain Site Characterization Office of the U.S. Department of Energy as our review of the Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (DOE/EIS-0250-D).

NARUC is a quasi-governmental nonprofit organization founded in 1889. Within its membership are the governmental bodies of the fifty States engaged in the economic and safety regulation of carriers and utilities. The mission of NARUC is to serve the public interest by seeking to improve the quality and effectiveness of public regulation in America. More specifically, NARUC is comprised of those State officials charged with the duty of regulating the retail rates and services of electric, gas, water and telephone utilities operating within their respective jurisdictions. We have the obligation under State law to assure the establishment and maintenance of such energy utility services as may be required by the public convenience and necessity, and to ensure that such services are provided at rates and conditions which are just, reasonable and nondiscriminatory for all consumers.

For any further information about NARUC or its interests in civilian radioactive waste management, contact us on the Internet at <a href="http://www.naruc.org">http://www.naruc.org</a> or

National Association of Regulatory Utility Commissioners 1101 Vermont Avenue, N.W. Suite 200 Washington, D.C. 20005

Telephone: (202) 898-2215

Fax: (202) 898-2213

#### This review consists of three parts:

- I. General Comments Comments on the DEIS as a whole and the DEIS process.
- II. Comments on Summary Comments on the separately bound DEIS Summary.
- III. Comments on Chapters 1-15 Comments on the DEIS Volume I.

We have used a code system for each comment or question for ease of reference.

#### I. General Comments

#### NARUC G-1. DOE Outreach Efforts

- The Department of Energy should be commended for the extensive efforts to involve the public in understanding the nature of the challenge of finding the best permanent solution to the problem of disposal of high-level radioactive waste. It is truly a national problem, not just for the present generation but also for many generations to follow. The "general public," beyond the State of Nevada or those who have no particular knowledge or interest in nuclear energy, may not be as aware of the waste disposal problem or its prospective solution. The Department of Energy has tried to educate the public on the issue through the DEIS.
- 2... DOE, it seems to us, has gone beyond the requirements of the National Environmental Policy Act (NEPA) in its approach toward the repository environmental impact evaluation and documentation.
  - It has taken four years from beginning of the process through the present time (with almost a year before the final decision will be made) in a very open process.
  - Public involvement has been extensive and continuous.
  - The professional expertise assembled by DOE to evaluate the nature of the geologic repository and the environmental effects that will be associated with building it, moving radioactive waste materials to it, emplacing the waste packages and forecasting the short and long terms effects on the environment is very impressive.
  - The scope of considerations examined is comprehensive and exhaustively evaluated and documented.

- Scoping sessions were held at 15 locations in 11 States.
- The DEIS has been widely distributed. In addition to hard copy distribution, the document has been available over the Internet and in CD-ROM.
- Twenty-one public hearings have been conducted in ten States have given thousands of people a first hand opportunity to learn more about the document and the waste disposal issue. Hundreds of organizations and individuals have been able to give oral comments for the record.
- The six-month public comment period was more than federal environmental guidelines suggest and shows the flexibility of DOE in recognizing that the document is extensive and requires time to digest, analyze and prepare comments upon.
- We know of no other environmental analysis for any project, federal or otherwise, that has attempted to examine environmental consequences 10,000 or more years into the future.
- Coordination and communication with other federal agencies, State and local governments, tribal organizations and public interest organizations has been extensive.
- While the public may not have agreed with the restricted scope of the DEIS, as the Nuclear Waste Policy Act specified, DOE attempted to explain that Congress did not intend the DEIS to evaluate the need for a repository, "revisit" the broad range of candidate alternative solutions (already evaluated in a programmatic environmental analysis in 1980) or look at other geographic sites already eliminated from further consideration by Congress in 1987. DOE nonetheless received numerous comments on both alternative disposal strategies and preferences for the repository to be built, if at all, in unspecified other locations besides Yucca Mountain.
- The use of a skillful facilitator from outside the federal government to conduct the public meetings in a professional and impartial manner helped to leave the impression with those participating in the meetings that they were fair and open. Each speaker was given respectful courtesies by the facilitator and the DOE representatives.

#### NARUC G-2. Right Balance of DEIS Contents

- Since the Congress eliminated the requirement to consider the need for a repository, other alternatives to geologic disposal or other sites besides Yucca Mountain, it might seem surprising that the DEIS contains over 1,400 pages. The CEQ guidelines suggest 150 pages should be sufficient for a typical EIS and 300 pages if the proposed federal action is "complex." We agree that this proposed action is complex and the document is not of excessive bulk.
- The DEIS is well organized, although not always reader-friendly, allowing reviewers to focus on topics of their own interest. The separately bound Summary is well presented and of value to those reviewers who may wish to know the general nature of the waste disposal problem and proposed solution but who lack the time or interest to examine the DEIS itself. Knowing that the DEIS and its appendices have supporting documentation is satisfactory for many who have a general interest in the project. Yet, there is much material available for review and analysis by those who have an interest to explore the topic in more depth.
- We will give our opinion elsewhere on the transportation topic, but would like to add here that we believe DOE has struck the right balance on the extent of its analysis of transportation of waste to the site. For those who may be interested in considering radiological or other risks related to transportation to Yucca Mountain, the DEIS provides some 'generic' risk analysis as well as some data on nature and locations of the material to be moved and a broad view of the transportation 'scenarios' for movement of waste to Nevada (and a 'national' analysis) then a more specific evaluation of truck and rail alternatives within the State.
- 6... Some critics of the DEIS transportation analysis have suggested DOE should have provided more specific information on exact quantities of waste to move over which specific transportation routes and modes. If that were to be done:
  - The 1,400 page document would have been even larger
  - More people along potential transportation routes would become anxious by some of the dramatization of risks that some who oppose the repository have portrayed. Some of the fears raised may be unnecessary (if they are valid at all) if the repository is not found to be suitable. At minimum, the timing of such concerns may be premature since there will be several years before Federal and State governments consider route and mode selection.

• DOE could find itself criticized for selecting specific routes and modes, when (as we understand it) DOE seems to be saying that the federal government wants to coordinate route selection with State and local officials.

We find the amount of material presented in the document on transportation issues to be appropriate for this stage in the planning and decision process. We don't believe that transportation factors will be pivotal in the decision to recommend that the geologic repository be built at Yucca Mountain. We believe strongly that, once the decision is made to proceed with the construction and licensing of the repository, the Federal Government does need to consult extensively with State and local governments, tribal organizations and other stakeholders in the planning of specific transportation modes and routes. We take note of the provisions in the NWPA for not only cooperative waste transportation planning but also emergency preparedness training of State, tribal and local governments. We support such planning and preparedness training and DOE's expressed intent to coordinate nuclear waste transportation with appropriate parties in sufficient time to enable safe transportation from the present 77 locations to the repository.

#### NARUC G-3. Lack of Contingencies

We understand that Congress has circumscribed the scope of this DEIS to an unusual extent (not requiring consideration of need, alternatives or other sites) for reasons that we agree with. Those factors were considered in the political process by the Congress in 1982 and, in the case of site selection, 1987. The present process is aimed toward a "go/no go" decision for suitability of Yucca Mountain followed some years hence by a successful license application that meets the requirements of the Nuclear Regulatory Commission (NRC) and leading to construction, operation and

eventual sealing of the repository. The NWPA enacted in 1982 envisioned all those steps having been successfully completed by January 1998 so that DOE could begin movement of waste from the present 77 storage locations. The earliest date for initial repository opening that DOE forecasts is 2010. Some observers, including many in our organization, have serious concerns that that date is too optimistic.

Given the guidance of Congress to narrow consideration of alternatives, DOE has also tried to meet the requirements of NEPA and Council on Environmental Quality (CEQ) guidelines to consider a "no action" alternative. CEQ gives several interpretations of what a no-action alternative might be:

 No change in current management direction or level of management intensity. 8

• The proposed activity would not take place

CEQ concludes "It is difficult to think of a situation where it would not be appropriate to address a 'no-action' alternative.<sup>1</sup>"

The DEIS does consider two No-Action Scenarios that the document carefully explains are included in the analysis. In the preface (page 2-1) to Chapter 2, the DEIS states, "DOE does not intend to represent the No-Action Alternative as a viable long-term solution but rather to use it as a baseline against which the Proposed Action can be evaluated." Further, on page 2-59, DOE states, "Under NWPA, if DOE decided not to proceed with the development of a repository at Yucca Mountain, it would prepare a report to Congress with its recommendations for further action to ensure safe permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority."

We realize, as does the DEIS, that there are many uncertainties over what Congress might do or not do if Yucca Mountain is not found to be a suitable repository. Nonetheless, it is our strong position that:

#### The No-Action Alternatives are Unacceptable

We will expand on that basic position elsewhere in the document, but we wish to state at this point that we feel that DOE should have considered another 'option' that is *not* a true alternative to the permanent geologic repository but is far preferable than either of the No-Action scenarios presented and analyzed. That superior option would be to have DOE assume responsibility for spent nuclear fuel (as it already has for the DOE high-level waste) and relocate it to either a central interim storage facility at Yucca Mountain or at other DOE-managed facilities suitable for the interim storage mission.

9... The spent nuclear fuel should be moved from present locations, as NWPA intended. Those sites were never intended for indefinite longterm storage.

As the DEIS points out clearly that keeping the spent nuclear fuel and high-level radioactive waste at 77 sites, whether under "institutional controls" or not, has unacceptably high human and financial costs. Even if Yucca Mountain were to be found not to be suitable for the repository (and nothing in the Viability Assessment or the DEIS indicates the likelihood that it will not be), the Yucca Mountain vicinity has so many favorable characteristics (dry climate, available federal property, relatively

<sup>&</sup>lt;sup>1</sup> CEQ 40 Frequently Asked Questions, Council on Environmental Quality Memorandum published in Federal Register, 46 Fed. Reg. 18026 (1981)

unpopulated with better security conditions than most existing storage locations) that it is clearly better and more efficient to have all the waste at a single site, pending the development of a permanent disposal repository at the best available location. Such an interim facility could be sited in such a manner as to not interfere with either the site characterization work or the development of the repository.

We recognize that the Clinton Administration has resisted the consideration of the Yucca Mountain site for interim storage because it was felt that developing an interim storage facility there would "prejudice" the decision to develop a permanent geologic repository there. We are unpersuaded by that argument. We regret that the intent of Congress for the federal government to assume responsibility for nuclear waste management by 1998 has fallen victim to delays of one sort or another and a cloud of uncertainty hangs over the current 77 storage sites.

### II. Comments on Summary

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NARUC ES-1. Page S-2. Decisions Related to Potential Environmental Impacts Considered in the EIS.

As we understand this section, it is the intent of the DEIS to serve as the environmental review document for the Proposed Action to "construct, operate and monitor, and eventually close a geologic repository." It also analyzes the potential impacts of transporting spent nuclear fuel and other high-level radioactive waste to the repository. Since there is uncertainty at this time about specific transportation decisions (such as routes, modes and shipping timetables) this section of the document seems to say that once such decisions are made to select corridors and modes, then more detailed studies can be conducted and NEPA reviews can be made.

We support this strategy as appropriate to the situation. We have seen the criticism expressed that the DEIS "fails" to provide adequate information on precise plans and schedules to ship waste materials from the 77 sites to the repository over exact rail routes or highways. The DOE posture on that issue seems to be "we don't know what those exact routes and schedules will be, but here's some generic data that you can use to conduct your own analysis over modes or routes in your area of interest and prepare to work with us on planning preferred routes, etc." Such an approach, it seems to us, should allow a State radiation safety official or transportation agency to conduct a "worst case" analysis assuming shipments through their State or region of interest.

While DOE has not proposed specific corridors in the 'National' transportation scenarios, it has shown particular rail and truck corridors within Nevada for extensive analysis in the DEIS. This makes sense:

- Because of the limited number of feasible rail or highway corridors within the State
- There is 100 percent certainty (if the repository is built) that waste material will move through that State compared with a much lower fraction of the 70,000 tons that will move through (for example) Tennessee.

We believe it is important to work with State and local governments and tribal organizations on transportation planning through their areas of interest and that the follow-on NEPA reviews are conducted in cooperation with those stakeholders.

### NARUC ES-2. Page S-6. Legislative History

Many of the public comments seemed to be unaware of the fact stated in this section that a full range of alternative nuclear waste disposal strategies were examined in 1981, resulting in the cited Record of Decision that selected deep geologic repository as the preferred method for long-term disposal of high-level radioactive waste. That was followed by the Nuclear Waste Policy Act (NWPA) that affirmed that selection as *national policy*. Further, Congress in 1987 chose Yucca Mountain from among the alternate sites as the only one to be examined in greater detail in the site characterization study process.

It gets less broad public attention, but the same NWPA also established the Nuclear Waste Fund as the mechanism through which those who have benefited from use of nuclear energy (in 34 States) also became obliged to contribute to payment of the expense of safe disposal of the nuclear waste by-product of the nuclear energy production process. A surcharge of one mill per kilowatt-hour has been in place since 1983 for that purpose. Those funds paid to nuclear power suppliers and collected by the U.S. Treasury have accumulated over \$16 billion to date. The uses of those funds were set forth in the NWPA to pay for all the site characterization work, DOE program management (including the several million dollars for the DEIS and all related public hearings) and eventually the construction and operation of the repository.

11... Some \$6 billion of the NWF has been used by DOE to study the Yucca Mountain repository site. Our organization, on behalf of all the ratepayers who have contributed over \$16 billion to the NWF, is deeply concerned about that investment which was intended by Congress to lead to the final solution to the difficult challenge of safely disposing the nuclear waste. We further are adamant that the spent nuclear fuel must be moved from the present locations by the Department of Energy as set forth in NWPA. That movement was to have begun in January 1998. If the Yucca Mountain site is not found to be suitable for the geologic repository, is that \$6 billion just sunk cost? Will refunds be made to those ratepayers?

We realize that there may not be answers for those questions, but we want to make the point that the development of a geologic repository is not some idle exercise and that the 21 public hearings which were held as part of the NEPA process and are not intended to serve as a plebiscite for nuclear power or waste disposal. Those matters were settled in the political process in 1982. It is now time to review the 'science' and other elements of feasibility for Yucca Mountain and get to the stage of packaging spent nuclear fuel and shipping it safely to the best location for disposal in the United States. Every nation which has developed nuclear power faces the similar problem of safe waste disposal. Some countries

with different geography may not be as fortunate to have such a favorable site, but all (to our knowledge) have concluded that geologic disposal is the best and safest disposal method.

12 NARUC ES-3. Page S-9. Proposed Action Scope Needs Clarification

The statement "The Proposed Action would include the transportation of spent fuel...to the site" seems to be at variance with the opening sentence in the section on 'Decisions Related, etc.' on page S-2. We suggest this be clarified in the FEIS and that the multi-stage approach to NEPA reviews for transportation described in our earlier comment (NARUC ES-1) be followed.

13 NARUC ES-4. Page S-10. Preferred Alternative.

The inset 'box' has a statement of the greatest importance that bears emphasis:

The analyses in this EIS did not identify any potential environmental impacts that would be a basis for not proceeding with the Proposed Action.

With some 1,400 pages of material and over four years of site characterization costing several billion dollars, it all boils down to that simple statement. We agree with the basic conclusion.

We think there are some socio-economic impacts for which we will suggest elsewhere that mitigation measures should be taken, but they are in the nature of improvements in program approach rather than something that would cite the conclusion highlighted above.

Conversely, we feel that the environmental impacts of the No Action Scenario of no institutional controls over nuclear waste left at present locations would be disastrous in terms of public health and must not be considered acceptable or feasible.

14... NARUC ES-5 Page S-10. Reference Design is Out of Date.

It is our understanding that the repository configuration used for evaluation in the DEIS is that which was evaluated in the Viability Assessment (referred to as the *reference design*.) The DEIS, generally, was developed based on data and knowledge available at the time of the analyses (not generally stated in the document, to our knowledge.) It is our understanding that the Department of Energy has subsequently accepted an *improved* design (EDA II), which is the basis for current planning.

We do not know the details of what parameters are "better" in the latest design, but presumably they are such that the repository performance will be improved. If the result is that the DEIS is less conservative than the more current design in terms of environmental impacts, those revisions should be emphasized in the FEIS. This point is addressed in the box on Page S-20.

## 15 NARUC ES-6. Page S-21. Transportation Alternatives

The DEIS defers to the future for deciding what combination of rail and highway alternatives will be used to move waste from the existing sites to the proposed repository. In our previous comment (NARUC G-1) we agreed with that approach. We believe it is worthwhile for DOE to be more specific in defining what the decision process will be in narrowing those choices.

Based on cursory analysis of the accident data for railroad vs. highway use, it is possible to conclude that the rail alternatives might be preferable because:

- Rail transport seems to have a better safety experience.
- Population exposure for rail transport under both the incident-free and accident scenarios is less than for a highway mode.

Those over-simplified conclusions may not necessarily suggest that rail should be selected as the preferred mode of shipping waste. There are other decision variables that may have a bearing on the ultimate decision after balancing all factors.

Perhaps it has been studied previously by DOE, but we are unsure whether sabotage threats have been analyzed and compared for shipment of nuclear waste by the various modes. It is possible that one of the attributes of rail shipment that may be advantageous for accident risk exposure may also be a disadvantage in terms of vulnerability to terrorism or other willful attempts to interfere with the shipments. We are not experts in such analyses, but we recommend that the transportation mode selection decision criteria be identified and views of various experts and perspectives be considered in making the optimum mode selection based on a comprehensive risk assessment.

# 17... NARUC ES-7. Page S-23. Railroad System Accuracy Questioned

Figure S-11 (and Figure 6-9 in Chapter 6) is labeled as a representation of the relationship between nuclear waste sites and the U.S. railroad system. There are eight sites in New Jersey through Maine that do not seem

proximate to railroad routes shown, yet there are numerous rail lines in that highly urbanized corridor. Are the maps accurate?

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NARUC ES-8. Page S-29. Continued Storage at Commercial and DOE Sites Under the No-Action Alternatives is Unacceptable

The main point of concern in this DEIS for the National Association of Regulatory Utility Commissioners is that both scenarios of the "No-Action Alternative" are unacceptable. They simply fail to meet the mandate of the Nuclear Waste Policy Act. Moreover, pursuing them would not be good public policy for these reasons:

No-Action Scenario 1. This scenario assumes that waste would be kept at current locations under what is presumed to be proper, safe management (as described in the DEIS) for 10,000 years. The stated costs associated with that approach is close to *five trillion dollars*. That figure is almost incomprehensible and wasteful compared with the total cost of the repository. We recognize this is a 'default' scenario, but it is simply financially infeasible.

No-Action Scenario 2. If the first scenario with institutional controls for the full 10,000 years is incalculably expensive, this scenario —while less expensive after the first 100 years—is inconceivable in terms of the risk it presents to human life in the regions where the waste would be left to deteriorate after the first 100 years. It is incomprehensible that such neglect would be allowed to occur. The release of radionuclides into the environment in the populated regions where the 77 sites are located would be catastrophic and must be prevented.

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NARUC ES-8. Page S-32. What is the Basis for Land Withdrawal Area Size Determination?

S. 4.1 indicates that the Yucca Mountain Repository land withdrawal area would occupy approximately 230 square miles or 150,000 acres. What was the basis for determining that should be the right size? Since most of the area is indicated for buffer area, what is the objective of the designation of the exact areas for withdrawal? Is it to prevent intrusion, isolate human exposure to radiation or perhaps to define a surface clear of human use and the protection of groundwater use from the subsurface below the surface buffer area. The document should explain what factors should be considered to designate a withdrawal area.

#### 20 NARUC ES-10. Page S-39. What is the Groundwater Risk?

The discussion about groundwater admits to uncertainties about the groundwater flow system in the region of the repository. The text does not address the on-going work being conducted by Nye County that will presumably reduce some of that uncertainty.

The wording of section S.4.1.4. is a little too opaque, it seems to us. In describing what would pose a threat to groundwater, the text says a "contaminant" would have to be spilled or released and then carried down by its own weight or by infiltrating water. Then it says the arid climate and depth to groundwater combine to reduce the potential contaminant migration. This section should be expanded and linked to discussions elsewhere about the specific (and only?) "contaminant" that is the dominant long-term concern for this repository: the contaminants of concern are radionuclides.

We have heard testimony at the various public hearings about risks to groundwater contamination due to theorized release projections of radionuclides. We have seen opinions expressed but we are unable to judge what factual basis there is for what seems like a branch of science in which uncertainty continues even as more data becomes available. Maybe better answers won't be available until the testing program results are analyzed or during the licensing application review process. Until then, it would seem that the section on groundwater could be improved to better educate the public than the current wording does.

## 21... NARUC ES-11. Page S-43. Socio-Economic Impact Analysis Flaws

We have heard complaints that the socio-economic analysis is inaccurate because the census data that was used is not current because of the rapid growth in Clark County and Southern Nevada.

We have a more basic concern that the analysis of socio-economic impacts examines the wrong region of influence. Elsewhere in the document (Page 3-71) DOE states that the region of influence was defined based on distribution of residences of current DOE employees and contractors who work on the project. Since 79 percent of those employees live in Clark County (metropolitan Las Vegas,) that county is included in the analysis of impacts from the development and operation of the repository. There can be little dispute that current employees have chosen those living patterns, for a variety of reasons, but does it necessarily follow that a future workforce associated with the repository construction and operation would also follow that pattern?

One of the consequences of using the larger region of influence than might normally have been defined for a similar project elsewhere, is that the effects of the project that might be a large proportion of, say, Nye County, with a population of 30,000 people but those same effects would have a much smaller impact as a proportion of Clark County (more than 700,000 people) when analyzed with Nye and Lincoln County.

In simple terms, the socio-economic impacts of the project are diluted by having such a large region of influence. There may, in reality, be some aspects of the project that may overwhelm the resources of the *immediate* vicinity of the repository, yet the regional analysis would indicate there would be no problem for the large region. As example, we understand that the emergency health care services in Nye County are limited, as is often the case in rural locations. Yet, if an accident were to occur on or close to the repository site it is little comfort to know that metropolitan Las Vegas—90 miles away—has ample medical treatment capacity. We challenge the statement (Page S-45) that "impacts to...public services from population changes in the region resulting from repository activities would be small." They may be small in proportion to the large regional study area but the more localized impacts in the area most proximate to Yucca Mountain will be more dramatic and potentially overwhelming in some categories.

We will return to this point with a suggestion for handling future socioeconomic impacts that is less centered on Clark County.

## 22... NARUC ES-12. Page S-45. Occupational and Public Health and Safety

Much has been said at public hearings and many comments are likely to be submitted regarding radiological impacts. It often seemed to us that opponents have made statements objecting to either building a repository in Nevada or anywhere or transporting nuclear waste at any time by any means. Often the statements were made without factual support and served to add to the fear that many seem to have of radioactive materials of any kind under any conditions. DOE has provided a helpful presentation of knowledge on this difficult to understand subject. While much of the data that is provided in the DEIS throughout the document is extensive, it may be studied by few and understood by even less. We encourage DOE and EPA to continue the public education on the subject of radiological safety so that more will understand the subject matter and become better able to tell the difference between fact and myth.

This section refers to radiological impacts to workers and the public for various thermal load levels in the repository. Those risks are summarized in the summary in terms of latent cancer fatality increases to various populations. However, we found no discussion and linkage to dose-based

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standards that have been the subject of different positions by the U.S. Environmental Protection Agency (EPA) and the NRC. The applicable standard for dose limits has not been established for the Yucca Mountain repository. If and when a standard is set it should be explicitly addressed in this section and in other sections of the FEIS.

While there has been much public speculation and expressions of alarm over radionuclide transport during the 10,000 year performance period and beyond, such concerns are based on levels of uncertainty that are difficult to prove or disprove. Likewise, there has been much concern and comment on radiation exposure during transportation to the repository even though the dose estimates provided are very small. Yet, there may be more direct exposure risks that have not drawn as much public notice. The latent cancer risks to repository workers during pre-closure period are given (page S-46) as 3-4 fatalities depending on thermal loads. This compares with one latent cancer fatality forecast (page S-48) among the general public during the 9,900 years following closure. If the comparison is correctly made, great care needs to be taken to protect worker safety during the pre-closure period. We would expect that the burden would be with DOE to demonstrate a sound radiological worker safety program in the operating license application with the goal of minimizing worker radiological risks.

#### NARUC ES-13. Page S-49. Accident Scenarios

This section and Section 4.1.8 of the DEIS refer to the more likely accident scenarios that those with an understanding of radiation related to nuclear waste would likely agree upon. The fatality estimates seem incomprehensibly small. Yet, the public has expressed great fear out of all sense of proportion to those historically determined risks. It could be that some people do not have the data or distrust it. It was unfortunate during some of the public hearings that some of the unsubstantiated predictions of risks associated with this project were not subjected to challenge or rebuttal. It would be helpful to have more public education on accident potential and relative risks. To illustrate the popular level of misunderstanding, many people refer to the possibility of an accident involving a nuclear waste shipment in which radioactive material "spills" out of its container causing extensive risks to those near the accident. The DEIS has a good explanation of the nature and form of radioactive material, yet many people have not grasped that knowledge. This is an area where additional public information is needed.

#### NARUC ES-14. Page S-51. Emergency Services Adequacy Questioned

The conclusion that "a large impact on the emergency services of surrounding communities or counties would be unlikely" needs to be

demonstrated. The statement suggests that the repository site will be managed largely on a self-sufficient basis. That will be necessary because of the nature of the facility and its pre-closure construction and operations (we also would expect this to be a requirement of the operating license.) From our observations, as referred to in NARUC ES-10, the resources in Nye County for this kind of support are meager and the resources in Las Vegas metropolitan area are mal-positioned to be of value in emergency situations at the site.

## 25... NARUC ES-15. Page S-53. National Transportation Impacts

We understand the position stated in the DEIS that DOE is uncertain when transportation decisions related to the repository will be made and accordingly specific routes and quantities to be shipped by various routes were not included in the DEIS. As we stated in NARUC G-2, we support that basic approach as appropriate for this time (when the DEIS was published in August, 1999.) As DOE heard loudly and often, in Nevada and beyond, the public does want to know more about how this project affects them and for many that takes the form of transportation concerns. Many people in urbanized areas already consider their local interstate systems a traffic "mess"—even without movement of nuclear waste or other hazardous materials. There is existing transportation policy that seeks to avoid urbanized areas when shipping radioactive waste, but (a) the public doesn't know it and (b) in some locations (including many of the sites of some of the public hearings) movement through populated areas on truck or rail is unavoidable.

We urge that DOE, NRC and the U.S. Department of Transportation begin (or continue with more focus) dialogue with each State transportation, public health or public safety organizations the State may wish on route and mode preferences. National and regional planning meetings with stakeholder organizations would be most helpful in improving communications and gaining greater public confidence.

The table of *Estimated National Transportation Impacts* (Page S-53) suggests that the mostly truck scenario has a higher risk compared with mostly rail, but the consequences of a rail accident could be substantially greater (still low) because the amount of material in a rail shipment is larger than in a truck shipment (roughly 50,000 truck shipments or 11,000 rail shipments in the two scenarios.) There will be many opinions, some well founded in factual analysis and others more intuitive, on which mode should be favored. We have no preference, but do urge State governments have a voice in the matter.

There may be some benefit to initiating a similar dialogue with the Nation's freight railroads in gaining a better understanding of the

operational and safety considerations of using rail shipments. If there are perceived public concerns over highway usage, Congress may support some targeted federally-funded safety upgrades for rail corridors and equipment that would be used for waste shipments. This may have already been considered, but it is worth further investigation. There were a lot of expressions of public concern over radioactive waste shipment safety. If an *improved* rail shipment could be found to provide greater safety benefits compared to highway, perhaps the public support can be developed to make investments that result in an even safer rail approach.

26 NARUC ES-16. Page S-54. Nevada Transportation Impacts

We find it appropriate for the DEIS to provide greater detail and some degree of environmental impact analysis of the rail and truck alternatives and the route corridor choices within the State of Nevada because:

- If the repository is built, 100 percent of the waste will be shipped through the State.
- Due to many remote and large sections of the State that have not been and may not be developable due to terrain and other factors, there are fewer corridor choices.

We urge DOE to work closely with the State of Nevada, affected Native American tribal organizations and sub-state units of government in refining those corridor alternatives. We are not in a position to suggest any preferences for corridor selection, as that is a matter best determined in a "partnership" spirit among federal, State and local governments concerned. We hope that the opposition by the State of Nevada to the siting of the repository within the State does not preclude appropriate State transportation agencies from working together on mode and route planning to best accommodate the repository if it is built.

27... NARUC ES-17. Page S-55. Caliente-Chalk Mountain Corridor

Notwithstanding the previous comment declining to present views on route alternatives within Nevada, we have one exception that brings out an important point about the role of other federal agencies in supporting the repository. It seems to us that the Caliente-Chalk Mountain corridor may have some attractive advantages over other routes:

- It is shorter than the other routes coming from the east
- It traverses federal land with less exposure to populated areas and avoids the truck alternatives that involve a two day one-way trip

Yet, the DEIS declares both the rail and heavy-haul alternatives along the Caliente-Chalk Mountain corridor to be "Nonpreferred alternatives" because their use is "strongly opposed by the U.S. Air Force because of adverse effect on security and operations at the Nellis Air Force Range." We can appreciate that the Air Force opposes such use, but if nothing else has been learned about this project it is that there are many people within the State of Nevada who also "strongly oppose" the movement of nuclear waste through their communities with a perceived adverse effect on their "security," as well.

We urge that DOE consider the Caliente-Chalk Mountain corridors just as objectively as other alternatives, noting the Air Force objection but also requiring more evidence that it is infeasible other than that it may interfere with security and operations. We recommend that the Secretary of Energy seek the support of the Secretary of Defense, if needed, to remind the Air Force that part of the "purpose and need" of the repository is to dispose of Defense Department radioactive waste. The Air Force should consider workarounds to enable their necessary missions to be performed and to permit the transit of waste through what appears to be "the shortest path between two points."

The federal government needs to do all it can to support this project and minimize the burden on the residents of what will be the permanent "host" State for disposal of nuclear waste used for nuclear power that was not generated or directly consumed within the State. Without a more detailed explanation of why this corridor cannot be built and used, we are left with the impression that such use is inconvenient to the Air Force. Nothing should be "off-limits" for *this* National Security project.

## 28... NARUC ES-18. Page S-56. No-Action Alternative

As stated in earlier comments, we understand DOE's decision to include the "No-Action Alternatives" in the DEIS as a baseline for comparison. While the presentation summarized in this section is useful to gaining public understanding of the consequences of failing to proceed with the repository, the analysis does not go into enough depth to ever satisfy the requirements of NEPA if either scenario were to be pursued.

Representatives of public utility regulatory bodies of five States appeared at several of the hearings and expressed the views of their commissions who represent the interests of ratepayers:

 The ratepayers have paid and continue to pay into the Nuclear Waste Fund which Congress established exclusively to collect and

- move the waste to a safe, permanent disposal site that will be opened at least 12 years late for that purpose.
- The present sites, while safe now and licensed as such by the NRC, were never envisioned to be used indefinitely
- Many of the reactor-site storage capacity limits have been or soon will be reached requiring the utility to incur unnecessary costs that would likely be passed on to the ratepayer
- If additional on-site storage capacity does not exist, nuclear power plants may need to be decommissioned prematurely with ratepayer cost consequences and possible shortages in regional electric generating capacity.

29 NARUC ES-19. Page S-57. Surrogate Regional Impact Analysis Flaw

Section S.5.2 summarizes the impact analysis detailed in Section 7.2.2.5.3 of the DEIS in which DOE organized the analysis into five hypothetical sites as "mathematical constructs for analytical purposes." While we do not desire to add volume to an already bulky document, we must disagree with the use of that type of radiological impact analysis of the No-Action alternatives. People live near 77 specific storage sites and are or will be concerned with spent nuclear fuel stored for 10,000 years in their individual communities and near their bodies of water. They may be unaware that this is the default course of action if the repository is not built. There were no hearings at nuclear plant sites although they were held in each of the five synthetic regions. Since there was no serious proposal for the No-Action alternatives of leaving the waste at present reactor sites, the primary thrust of public concern at most of those hearings was on transportation to the repository assuming it will be built.

An alternative analysis might have been to select an actual "typical" commercial site storage location and a DOE site and conduct and present the results of analyzing impacts with actual data rather than a "mathematical construct" which few but the analyst understands. Sometimes people don't want to know about the "big picture" of 3,300 additional latent cancer deaths compared with 900 million expected from other causes over 10,000 years. They would likely be more alarmed if a site-specific forecast were made for their local storage site.

#### NARUC ES-20. Page S-59. Cumulative Impacts

We support the inclusion of additional analyses relating to cumulative impacts of the Nevada Test Site and other activities affecting the same region as the repository. That is how it must seem to many long-time

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community residents who have been "living with" the impacts of those other activities. Conducting such analyses and providing them to the community would show an appropriate effort to see things from their perspective rather than "having the blinders on" by looking only at the repository impacts.

We are less certain that it is appropriate to consider emplacement of additional waste beyond the NWPA established maximum quantity of 70,000 tons (Inventory Modules 1 and 2.) We realize that the quantity of material to be disposed may grow to those levels, but there are many uncertainties associated with how and where that will be disposed. While it is a potential additional quantity to be brought to Yucca Mountain it may not be a real-world possibility. It seems speculative to conduct such an analysis for this document.

## 31... NARUC ES-21 Page S-62. Management Mitigation Actions

We may have missed it but there does not appear to be any reference in this section or Chapter 9 that considers socio-economic impact mitigation measures for the proposed action. That may be because the socio-economic impact analysis was conducted for an extraordinarily large region of influence that included metropolitan Las Vegas and concluded all impacts were negligible. (See NARUC ES-11 for our critique of that approach.)

DOE should consult with appropriate officials within Nevada and Nye County over alternative means of obtaining community support closer to the site than Las Vegas for a period of peak support need during construction and pre-closure phases of the repository use. However, all such infrastructure would be developed just for that period of need and should be removed at the stage when all the waste has been emplaced and support needs are greatly reduced.

A support "base" could be developed under federal government ground rules and some financial support that could serve many of the housing and community support services closer to the site than Las Vegas, yet would not lead to further permanent development near the repository if there is the risk of radiation, *however small*, over the long-term performance period of the repository.

There are costs and benefits of such a government-managed approach, but they are worth examining together with State and local stakeholders. The dual objective should be:

 Provide some support functions closer to the repository than Las Vegas,

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• Not encourage *further* development in an area which was chosen for being lightly populated

We realize there is already some resentment among some portion of the Nye County area population over "the government" being an intrusion in their lives. We simply suggest that some cooperative government mitigation measures be considered that enable the repository to be built and reduce the burden on present residents. The suggestion is to consider how to best accommodate an influx of increased demands on community services by having them cooperatively managed with federal government assistance. It may not be the complete answer, but it is worth considering through cooperative public-private planning.

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NARUC ES-22. Page S-63. Unavoidable Adverse Impacts Should be Compared with the Much Greater Impacts of No Action Alternatives

We recognize this section is a requirement of NEPA, but to the reader it could be misinterpreted in terms of comparative risks and consequences. For example, the first bullet on page S-63 states that the permanent withdrawal of approximately 230 square miles of land for the repository would likely prevent human use for other purposes. To someone living in urbanized areas and unfamiliar with the character of the land in question, that seems like a large quantity of land to be "lost." Yet, page 10-1 states the land "has a low resource value, is remote, and is partly withdrawn, the resultant impact would be small." (emphasis added.)

If a similar comparison were to be provided of consequences of similar sized 'withdrawal' from use adjacent to the 77 current storage sites over the 10,000-year period under the No Action Alternatives, the adverse impacts would be profound and unacceptable.

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The potential for transportation of the waste to "affect workers and the public through exposure to radiation and vehicle emissions, and through traffic accidents" is listed as an unavoidable adverse impact. There is substantial and adequate detailed information and analysis on that potential in Chapter 6. While there are less vehicle emissions and traffic accident impacts in the No Action Alternatives, the radiological impacts are substantially less under the Proposed Action than by leaving the waste at the 77 sites for 10,000 years under either scenario.

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We respectfully disagree with the view of the Native American tribes that "the proposed repository and its facilities would further degrade the environmental setting." The surface facilities will be used and removed at the end of the pre-closure period, as we understand it. The withdrawal of

230 square miles from use suggests that the land will be protected and risk to groundwater is minimized.

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That only ten pages were needed in Chapter 10 to provide information on unavoidable adverse impacts, short-term uses and long-term productivity and irreversible and irretrievable commitments of resources seems proportionate to the relatively minor consequences of those impacts. A more comprehensive analysis of the long-term consequences of the No Action Alternatives at the 77 sites—or even a single typical site—would demonstrate the balance of risks strongly favor the central geologic repository approach to solving the radioactive waste disposal problems of the Nation.

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NARUC ES-23. Page S-64. DEIS Findings Clearly Support the Conclusion that the Proposed Action is Far Superior to No Action

The first two sentences of the first paragraph summarize well what the 1,400 page DEIS demonstrates: the impacts of the Proposed Action to develop the repository at Yucca Mountain are minor. Conversely, we simply repeat the third paragraph:

"There could be large public health and environmental consequences under the No-Action Alternative if there were no effective institutional control, causing storage facilities and containers to deteriorate and radioactive contaminant from spent nuclear fuel to enter the environment. In such circumstances, there would be widespread contamination at the 72 commercial and 5 DOE sites across the United States, with resulting human health impacts."

(emphasis added.)

Anyone who attended the 21 public hearings certainly heard numerous public expressions of fear over the perceived harmful radiological effects of either the repository itself or transportation of waste to it. That testimony, while sincerely stated, was often unrelated to the information in the DEIS. The harmful effects of the No-Action Alternatives – though greater by orders of magnitude and more certain –drew less attention, even though the DEIS does provide demonstrable quantification of the aggregate risk. That may be because:

• DOE is not actually proposing to leave the waste in those 77 locations for 10,000 years, and

No analysis was provided for the long-term effects in a specific or typical temporary storage site, nor was a public hearing held at such a location

We share the conclusion of Section S.11. We would restate it ourselves that there is simply no comparison of the certain and far more harmful impacts of either of the No-Action Alternatives with the relatively minor and manageable impacts of the Proposed Action.

NARUC ES-22. Page S-66. Table S-1 Needs More Clarity of the Meaning 37 of the Data it Displays

Just as we felt the major findings of the EIS in S. 11 needed more emphasis. Table S-1 needs some improvement because it is the summary display of the supporting evidence that led to the findings.

For example, the impact on hydrology for the Scenario 2 is more than just "Potential for radiological contamination of groundwater around 72 commercial and 5 DOE sites." Is it not a certainty that there will be contamination in that scenario if the spent fuel and other waste are left unmanaged over the 9,900 years after institutional controls no longer exist?

We find some difficulty (and assume others do) in interpreting the data displayed to represent the long-term consequences in occupational health and safety for the Proposed Action and the Scenario 2 No-Action Alternative. The Latent Cancer Fatalities (LCF) for the Maximally Exposed Individual (MEI) and population are  $4.4 \times 10^{-5}$  and  $5.3 \times 10^{-4}$  for the Proposed Action compared to death within a few months for MEI and a population of 3,300 for Scenario 2 with a footnote that "downstream exposed population of approximately 3.9 billion over 10,000 years." (emphasis added.) We conclude that there is a very slight radiological risk over 10,000 years under the Proposed Action. That compares with thousands of deaths with No-Action Scenario 2 and billions of people potentially exposed "downstream." If we have interpreted that even correctly, it should be presented more boldly in the Summary. If we have drawn an incorrect conclusion, then maybe others will and the table should be revised to prevent misinterpretation.

NARUC ES-23. Page S-65. The Proposed Action Poses Some Small Health Risks in the Short-term While No Action Alternatives Pose Either Far Greater Health Risks or Unimaginable Financial Costs

Based on S.11.3, the impacts can be summarized as follows:

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Impact Type	Proposed Action	No-Action Scenario 1	No-Action Scenario 2
Socio-Economic	2,400 jobs	Jobs lost	Jobs lost
Health (Latent Cancer Fatalities)			
Transportation	6-28	0	0
Construction-Pre-closure	3-4	16	16
First 100 years <sup>a</sup>	22-50	25	25
Long-term (100-10,000yrs)	<1	15	3,300

a. Includes non-radiological fatalities in all scenarios

It would be irresponsible to suggest that the Scenario 2 No-Action Alternative is acceptable in terms of long-term public health. Further, it does not fulfill the objective of the Nuclear Waste Policy Act, namely that it not only does not provide for geologic disposal of nuclear waste, it also does not isolate the waste from the environment.

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The DEIS is required to address environmental impacts of the repository to satisfy the legal requirements of NEPA. Decision makers will have to also weigh the financial considerations of the alternatives to a far greater extent than this document provides. Section S.3.1.4 provides a cost estimate for the construction, transportation, operations and monitoring for the first 100 years of \$28.8 billion.

The No-Action Alternatives would both cost between \$51.5-56.7 billion for the same period. Scenario 1, however, would also require an additional \$480-529 million annually for the remaining 9,900 years. In 1998 dollars, that amounts to about \$5 *trillion*. That passes a monumental obligation to future generations, representing poor public policy totally contrary to the underlying principle of inter-generational equity stated by national leaders since the 1970's.

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The No-Action Alternatives fail to meet the mission of permanent isolation of high-level radioactive waste from the environment.

#### III. Comments on Chapters 1 through 15

**General comment:** We repeat our praise for the organization and comprehensive scope of the DEIS. We found the Summary to be adequate overview of the document since we have less expertise on the technical details of repository design and performance. We reviewed selected portions of the Volume I and II main text and have a few comments on material in those volumes.

NARUC 1-1. Page 1-21. Use of No-Action Alternatives as a Baseline for Comparison Confuses Many

We commented previously (NARUC G-3) about the lack of contingencies should Yucca Mountain not be determined to be suitable. We realize that Congress has directed this approach, just as we understand the 1980 EIS on commercially generated waste<sup>2</sup> assessed the spectrum of potential permanent solutions to waste disposal. Over and over, groups and individuals appearing before the DEIS public hearings expressed their disagreement with either the concept of an underground repository anywhere or in Yucca Mountain. It was as though the previous considerations in 1980 and later with the NWPA had no validity to them. People who were not aware of the past were seeking a new start in the process.

- As an organization concerned with protecting the *investments* of ratepayers who have contributed over \$16 billion toward the solution to this difficult challenge, we want the federal government to fulfill its obligation under NWPA to design a safe repository that isolates the waste from the human environment, license it, build it expeditiously and begin transporting waste to it at the earliest.
- We agree with the conclusion in the DEIS that considering other potential actions, should the decision be made not to develop the repository at Yucca Mountain, would be "speculative." Opponents of the Proposed Action at the public hearings have either offered no true alternative solution that meets the objective of NWPA—permanent isolation from the human environment—or they have urged DOE to "leave it where it is," which is the essence of the No-Action Alternatives. The analyses of those alternatives, however cursory, should be compel the conclusion that those default approaches fail to meet the objective and are either too expensive or have widespread unacceptable health consequences.

<sup>&</sup>lt;sup>2</sup> Final Environmental Impact Statement, Management of Commercially Generated Radioactive Waste (DOE, 1980)

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# NARUC 2-1. Page 2-7. Even Though the DEIS Examines Just One Alternative, There Are Still Many Other Implementation Choices

Figure 2-5 shows the array of choices in both repository design and transportation of waste that stakeholders have an opportunity to review and comment upon. We confident that the Department of Energy and other federal agencies involved will consider each of these important factors in developing the best balanced approach to repository design and operations that places safety as the foremost consideration. We urge that the process continue to be open to coordination with State and local governments and other stakeholders and that a public education program continue.

We know that much effort has gone into the site characterization process and that scientific studies have been conducted to help develop preliminary repository designs and operational planning. Program schedules show that there will be several more years of effort and hundreds of millions of dollars expended to refine each of those details to be included in a construction license application to be presented to the independent Nuclear Regulatory Commission for a rigorous review before granting a license now scheduled no sooner than 2005.

### NARUC 2-2. Page 2-50. Is the Use of Heavy-Haul Trucks Feasible?

We are struck by the size of the heavy-haul truck illustrated in **Figure 2-33** (220 feet long with an empty weight of 100 tons) that would be used to move waste from an intermodal transfer station connecting with national rail system. Section 2.1.3.3 indicates "the heavy-haul truck would travel on existing roads to the repository" and average trip speeds would be 20-30 miles per hour.

Is the use of such equipment on "existing roads" within Nevada really feasible?

We would strongly urge that a feasibility study be conducted, if not already done, and that it be fully coordinated with Nevada transportation agencies. While waste transport by rail seems attractive from a safety standpoint, if there is no rail link to the site, use of such heavy equipment to complete the movement may shift the balance to highway legal shipment nationally as well as in-State. Considering such alternatives, makes it all the more urgent to move forward with the Site Recommendation decision process so that these important related transportation choices can be examined more completely. There are references in the DEIS to some transportation studies that have been done, but we are unaware of their extent or whether they were developed in cooperation with State and local governments.

### NARUC 3-1. Page 3-73. Socio-Economic Analysis Needs Revision

NARUC ES-11 gave our opinion that the socio-economic analysis is flawed by choosing an overlarge region of influence that includes metropolitan Las Vegas. We think a segmented or two-tier approach might be more appropriate:

- Primary Impact: Portions of Nye County and other areas with adjoining boundaries to the repository using some criterion like a 25 mile zone
- Secondary Impact: Balance of Nye County and other areas (including Clark County/Las Vegas) with socio-economic resources related to or affected by the repository

Nye County is relatively fast growing. We understand Nye County residents have complained that county population has grown far greater than the 26,000 level shown in the DEIS. More current data should be included in the FEIS and used for refined localized socio-economic analysis.

## NARUC 3-2. Page 3-140. No-Action Hypothetical Site Analysis

NARUC ES-19 gave our opinion that the use of five hypothetical regions in the DEIS to examine the projected environmental impacts for the current storage locations in those regions was flawed. The result of developing a mean average that encompasses, for example, coastal California, the Rocky Mountains and the deserts of Arizona and Nevada is meaningless as is "averaging" North Dakota with Louisiana.

It might have been more meaningful to conduct either a detailed analysis of a sample of the 77 storage sites or use a different basis for regional analysis. Examples of the latter might be:

- Six plants along the shores of Lake Michigan
- River watersheds such as the upper Mississippi

## 48... NARUC 4-1. Page 4-62. Data Displays Are Difficult to Comprehend

This is a general comment that is illustrated by **Tables 4-35** and **4-36**. Each table contains 128 data elements for radiological consequences for 16 types of accidents that might occur within the repository or in the surface facilities. Appendix H has more supporting documentation

including three pages of references. Absent a pedigreed scientist to interpret them, the typical reviewer may tend to stare at the data display and wonder what it all means.

We heard a lot of concern expressed at public hearings about accidents, but concerns seemed to be more based on intuition than review of these two complex tables (and others throughout the document.) With safety as the foremost consideration to most people, we suggest more explanations be included with such complex tables and charts so that non-experts can better understand what is before them.

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NARUC 4-2. Page 4-110. Receipt Prior to Start of Emplacement at Midway Valley Wash or Elsewhere at or near Yucca Mountain

NARUC is deeply disappointed that the repository was not opened by the January 1998 date set in NWPA. Ever since it became apparent that the deadline would not be met, we have urged that a central interim storage facility be developed by DOE to enable shipment of waste from many of the decommissioned nuclear plants and others where site storage capacity limits were approaching.

Central interim storage at Yucca Mountain (or any other DOE-controlled facility as an alternate) has been resisted because, we were told:

- It was not affordable to continue the site characterization for the permanent facility and to package, ship and store waste at an interim facility (even though revenues collected for waste disposal have exceeded program costs to date and Congress has diverted the balance)
- Creating such a facility at Yucca Mountain would prejudice the site suitability decision

We continue to urge DOE to move waste from present storage sites to *any* other federally managed (and suitably licensed) storage facility.

Congress is also concerned about moving the waste at any earlier point than 2010. Attempts at passing legislation specifically enabling either monitored retrievable storage or central interim storage have fallen short of enactment. In February 2000, the Senate passed S.1287, a bill that would have authorized "early acceptance" at Yucca Mountain concurrent with the application of the permanent repository construction license. That would be in 2007—still nine years past the 1998 NWPA deadline.

While comprehensive nuclear waste legislation may be stalled again this year, Congress will likely revisit the matter of early acceptance of waste.

DOE should give serious attention to developing a temporary storage capability at an area at Yucca Mountain, such as Midwest Valley Wash or any other site suitable for that purpose.

50... NARUC 5-1. Page 5-10. We Commend DOE for Candid Treatment of Uncertainty in Long-Term Repository Performance

DOE and its contract support team of scientists, engineers and other specialists are attempting to design a project that will perform over a period of time unprecedented in history. Due to the nature of radioactive materials, the project needs to ensure to the greatest degree possible that the danger of radioactive effects are isolated from human contact. The period of performance for the repository system is set at 10,000 years.

Since no facility of this type and purpose (possibly excepting the Waste Isolation Pilot Project, which has a different materials and geologic context) has been built before and even the understanding of radiation is still evolving, there is much uncertainty involved with this program. DOE seems to have identified every element of the repository design and operation and assessed the levels of uncertainty from many angles. The public may have little appreciation of the care with which DOE is exhaustively studying all variables.

The DEIS in Chapter 5 and throughout the document has addressed uncertainty quite explicitly and should be praised for the candor of doing so. An example of this is the statement on page 5-10 "Some conceptual uncertainty exists regarding the influence of heat on water movement in the unsaturated zone." It has been said that, "Yucca Mountain is the most studied piece of real estate on Earth." All those studies and experiments that have been conducted and are underway are being done:

- By highly professional people with the best tools available
- In a transparent and open process
- With extensive peer review, both national and international

**Table 5-3** shows the levels of confidence and significance of uncertainty just for the long-term performance of the repository system in relation to groundwater contamination. We are taken by the quotation from the Total System Performance Assessment Peer Review Panel (page 5-23) that "the overall performance assessment framework and the approach used in developing the TSPA-VA were sound and followed accepted methods." It is unfortunate that the critics of the repository program have so little appreciation of the care and professionalism with which the DOE Yucca Mountain team is proceeding with site characterization work and can be

expected to deploy in the remaining steps leading to licensing, construction and operation of a safe repository.

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NARUC 5-2. Page 5-25. Radiation Dose Standards Needs Revision to Relate to the EPA Proposed Rule

The presentation of long-term waterborne radiological consequences in section 5.4 is difficult for the layperson to follow. Despite careful review, we were unable to find reference to radiation standards. We realize that the proposed radiation standard<sup>3</sup> was issued by EPA subsequent to the publishing of the DEIS. The data displays in **Table 5-4** indicate that dose rates for the maximally exposed individual (MEI) would be less than the 15 millirem/year standard in the EPA proposed rule (15 mrem/year) throughout the 10,000 year performance period according to model simulations. That data is for just one of the three repository design thermal load options. As a consequence, it is easy for the non-expert to get confused with "too much data" and too little understanding.

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Another example of such potential confusion to the layperson is **Table 5-7** displaying "peak radionuclide concentrations" in picocuries per liter for ten different radionuclides at four distances from the repository with both mean and 95<sup>th</sup> percentile consequences. Such data may be helpful to the scientists involved in the repository design or later in license application review, but it lacks meaning to the non-expert.

What is the meaning of population dose? It is presented in terms of "person-rem." There is a definition in the box on page 5-25, but we are unaware that there is a proposed standard for such a parameter. It is calculated for the three thermal load cases but the explanation of the value of the data is not clearly presented.

Put another way, which data is the most appropriate figure of merit for radiological consequences:

- Peak dose rate (millirem/year)
- Population dose (person-rem), or
- Peak radionuclide concentrations (picocuries/liter)?

This section (5.4) should be revised and tied in more explicitly to the EPA proposed standards.

Finally, it would be helpful to make notation on all charts, such as Figure 5-4, when non-linear scales are used.

<sup>&</sup>lt;sup>3</sup> Environmental Radiation Standards for Yucca Mountain, Nevada 40 CFR Part 197

# NARUC 7-1. Page 7-40. Environmental Consequences of the No-Action Alternative Scenario are Intolerable and Probably Understated

We have already conveyed our opposition to either of the No-Action Alternatives as failing to solve the problem of permanent isolation of nuclear waste from the environment as well as being:

- Grossly unaffordable (Scenario 1)
- Intolerably hazardous to human health (Scenario 2)

We appreciate the inclusion of Chapter 7 in the DEIS, our previous complaints about some of the methodology notwithstanding, and wish there was greater public understanding of those high human and financial costs that would result if the government fails to meet the obligation to the American people in the NWPA.

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We have confidence in the safety of *temporarily* storing spent nuclear fuel at commercial reactor sites. Those facilities are all licensed by the Nuclear Regulatory Commission and are capably managed by the license holders for finite periods of time. All current license holders were required to enter into a contractual agreement with DOE on the eventual removal of the waste by DOE at a certain sequence beginning in January 1998. That date was not met and will not be met for at least seven more years at the earliest. As a consequence, because many sites were running out of capacity to store the fuel that was still being spent, license holders had to take other measures, at the expense of ratepayers, to expand the site storage capacity as well as manage it beyond the point that DOE was obliged to assume responsibility for the waste. Some of the utilities facing that situation have sued the Department of Energy to recover their unanticipated expenses resulting from DOE's failure to perform.

It is clear, however, that the present commercial waste storage sites were never designed, licensed and built for *indefinite* storage of waste. Seven State Governors wrote to the President in February 2000 expressing their fear that if the Department of Energy takes title of the waste and leaves it on-site pending eventual transfer to the Yucca Mountain repository, those sites "would become *de facto* permanent disposal sites." Further, assuming many of the nuclear plants are eventually decommissioned (as 14 have already shut down) there would be no ability to reclaim the land for other use. Whether that pessimistic view is valid might be debated, but that perspective touches upon the consequences if the No Action Alternative were to become the default scenario.

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We will highlight one sentence from page 7-40 that indicates why the Scenario 2 No-Action Alternative cannot be tolerated:

"In addition to the potential 3,300 potential cancer fatalities under Scenario 2, more than 20 major waterways of the United States that currently provide domestic water to 31 million people...could be contaminated with radioactive material."

(emphasis added)

The same section (page 7-40) adds:

"For Scenario 2, localized impacts to individuals from degraded facilities at the 77 sites could be **severe**."

(emphasis added)

We realize the premise of Scenario 2 is that there would be no institutional controls after 100 years, but those consequences would be intolerable. That would lead to either Scenario 1 with a massive financial burden or the "re-discovery" that a geologic repository is the best answer and we should have summoned the will and the means to build it as our elected representatives decided for us with the passage of the Nuclear Waste Policy Act in 1982. If government, industry and the American people collectively fail to fulfill that vision and leave the consequences of either No-Action Alternative to future generations, the Nation will have failed on a massive scale.